

OPTIMIZATION OF SUPERCRITICAL FLUID EXTRACTION PROCESS FOR MORINGA (PKM-1) SEED KERNEL OIL

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ABSTRACT

Oil was extracted from moringa (PKM-1) seed kernel by using supercritical fluid (SC-CO₂) extraction process. Supercritical fluid pressures of 100, 150 and 200 bar and temperatures of 40, 50 and 60 °C were considered for optimization of the extraction process. The extraction yield and extraction efficiency varied in the range of 31.87 to 37.76 g/100 g and 83.32 to 98.43%, respectively. Maximum extraction yield of 37.76 g/100g and extraction efficiency of 98.43% were obtained at supercritical fluid pressure of 200 bar and temperature of 40 °C. The desirability at optimum operating condition was found to be 0.98. Supercritical fluid extraction of moringa seed kernel oil was found to be an efficient and more convenient method as it is non-toxic and easy to separate the solvent from extracted oil by just depressurization. The production cost of oil from moringa (PKM-1) seed kernel using supercritical fluid extraction equipment was estimated and benefit cost ratio was found to be 1.83:1.

KEYWORDS: Supercritical Fluid, Carbon Dioxide, Extraction, Yield, Efficiency, Optimization